Bermudas, which are more than three times the distance from the nearest mainland, will give some idea of the differences in the age of the two. The latter contains no endemic genus, and only about half a dozen species, and these are not of a highly differentiated character—one is a portion of a very old flora, and the other a flora of recent derivation. The small flora of Juan Fernandez (which lies about 400 miles from the coast of Chili) contains 21 per cent. of endemic genera and 78 per cent. of endemic species.

The endemic element in Socotra is distributed over fifty-four natural orders, and includes some highly curious types, such as *Cocculus Balfourii*, remarkable for its thick rigid cladodes and often leafless condition; *Thamnosma socotrana*, a member of a Mexican genus; *Dirachma*, a geraniaceous genus of American affinities; *Dendrosicyos*, unique in the Cucurbitaceæ for its arboreous character; *Trichocalyx*, a new genus of the Acanthaceæ; *Cockburnia*, a new genus of the almost exclusively African Selagineæ; and *Cœlocarpus*, a new genus of the Verbenaceæ, having strong American affinities. Of the 136 genera to which the endemic species belong, 98 are only known to be represented by endemic species; and of the 20 endemic genera, 18 are monotypic. The isolated types of American affinities are a repetition of what has also been observed in the fauna and flora of Madagascar.

In summing up, Dr. Balfour finds that the affinities of the flora are essentially tropical African and Asian, the former more pronounced. A former, though very ancient, land connection with Africa he regards as conclusively proved, and the evidence strongly favours the supposition that it was also united with Arabia. With regard to the element of strongest American affinity, its presence is still an unsolvable problem. W. B. H.

THE METALLURGY OF GOLD.

The Metallurgy of Gold; a Practical Treatise on the Metallurgical Treatment of Gold-bearing Ores. By M. Eissler. (London: Crosby Lockwood and Son, 1888.)

THE title suggests that this little volume is a more comprehensive treatise than the author has attempted to write, but it is nevertheless likely to be useful to a large class of readers.

There is a wide-spread belief that, as much of the gold in Nature is found in the "native" or metallic state, its metallurgy must be comparatively simple; and so it would be in nearly all cases if it were not for the fact that the precious metal often occurs in a very fine state of division, or in association with sulphides and tellurides of other metals. Ignorance as to the true nature of such ores has led to their being considered to be "base" or "rebellious," and has entailed much loss and disappointment.

It is asserted, on p. 5, that native gold is never quite pure, being almost invariably alloyed with silver; reference might, however, have been made to the interesting deposit of gold of exceptional purity recently discovered at Mount Morgan, in Australia.

The author points out that "the loss on working gold ores, even with our most modern appliances, is still enormous"; and he gives, among other statistical statements, the results of seven years' working in Colorado, where the average value of the precious metal in the ore, by assay, was £7 18*s*. per ton, while the amount actually extracted was only £3, showing a loss of over 60 per cent. A large section of the work is devoted to the consideration of methods of concentrating the free gold lost during crushing and amalgamating, and the processes for extracting the gold either by amalgamation or by chlorination. The author writes with a practical experience of the processes he describes, but his information is in many cases not up to date.

The illustrations are usually very clear, but in no instance is the scale on which they are drawn given, and there are too few references to the dimensions of the appliances described. The appearance of the illustrations often suggests that they have been borrowed from the trade circulars of the makers of mining machinery. It would surely have been possible to give a more intelligible section of a chlorination works than the one (p. 142) which was suitable enough for its purpose when it originally appeared as an incidental illustration to an Official Report to the United States Government published in 1873; and a far more useful drawing might have been found to accompany the description of the refining of gold by Miller's process than the diagrammatic one which was drawn eighteen years ago by the writer of the present review in order to make the nature of the process clear in an Official Memorandum.

More useful information than is to be found in the twenty-one pages devoted to assaying might easily have been condensed into them, and it is much to be regretted that no attempt has been made to deal with the treatment of tellurides, which are so troublesome to the smelter, and have occasioned so much loss. In a future edition it would also be well to give a description of the process of collecting the precious metals in lead, which plays so important a part in the smelting of complex auriferous ores of lead and copper. Hydraulic mining, also, should find a place. Certain defects of style will no doubt be corrected in a second edition; this will be welcome, for, although the work is hardly in sufficient detail to justify its being called a "practical treatise," it will be useful, especially to men who are engaged in smelting. The author suggests that it contains sufficiently full information for "investors and others interested in gold-mining operations who may wish to gain an intelligent insight into the *modus operandi* at the gold-mines." To them it may be warmly recommended, for, although the element of speculation can hardly be separated from genuine investment in gold-mines, the "adventurers," to use the old name, often deliberately neglect all investigation into the nature of the methods by which they hope to profit. W. C. ROBERTS-AUSTEN.

OUR BOOK SHELF.

Viaggio di L. Fea in Birmania e regioni vicini. II. "Primo saggio sui Ragni Birmani." Del Prof. T. Thorell. (Genova: Tipographia del R. Istituto Sordo-Muti, 1887.)

DR. THORELL deserves our best thanks for having begun a faunistic work on the spiders of Burmah; still greater would have been our gratitude had his minute and exhaustive descriptions been accompanied by figures of the numerous new species recorded. One of the greatest hindrances in the study of exotic araneology is the paucity of such works. The present, however, is not

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the first contributed, by Dr. Thorell's labours, for the supply of works on the spider-fauna of exotic regions: witness his extensive work, "Studi sui Ragni Malesi e Papuani," in three volumes, 1877–81, describing and recording over five hundred species of the spiders of that richest of all known exotic regions, the Malay Archipelago. Up to the time of the publication of the present volume, but few Burman spiders were known, the earliest being an Epeirid, described by the late Dr. Stoliczka in 1869. This was followed, in 1878, by two others recorded by Mr. T. Workman, of Belfast; eight more were recorded in 1881 in Dr. Thorell's work above mentioned (on the spiders of the Malay Archipelago); and finally, twenty-two more by M. Eugène Simon in 1884. The total number of species of Burmese Araneidea now known is 163, by far the larger portion being new to science. Dr. Thorell records 145 species, of which 90 are new to science, and 130 new to Burmah. These figures doubtless give a very meagre idea of the spiders of such a rich zoological district as the Burmese Empire. Not to mention its situation in the tropics, Burmah has much in common with the productions of China, Siam, India, and the Malay Archipelago. We may therefore safely hazard a conjecture that the figures given by Dr. Thorell can scarcely represent a twentieth part of the spiders of Burmah. It is to be hoped that since the—still comparatively few—species as yet known have been collated in the present work, an impetus will be given to natural history collectors to add to our knowledge. For the want of figures in Dr. Thorell's work there is some compensation in the concise diagnoses which head each lengthened description. Excepting the introduction, which is in Italian, the work is written in Latin. It is exceedingly well got up, forming a handsome volume of over 400 pages, and is dedicated to the Rev. O. P. Cambridge, General A. W. M. Van Hasselt, and Dr. Ludwig Koch. The greater part of the Burmese spiders described by Dr. Thorell were collected by Signor Leonardo Fea, mostly in Upper (or North) Burmah; and of the rest some were collected in its southern and some in its central districts.

O. P. CAMBRIDGE.

An Introduction to Practical Inorganic Chemistry. By Wm. Jago, F.C.S., F.I.C. (London: Longmans, 1888.)

THIS volume of 72 pages is chiefly taken from the author's "Inorganic Chemistry, Theoretical and Practical," and has been separately issued by request. It is doubtless sufficiently exact for students who are preparing themselves for the "growing number of examinations in which the practical analysis of one or more simple salts is required," and therefore presumably it will serve the end for which it was designed; but it contains many statements that would tend to confuse the genuine student, and give his teacher unnecessary trouble. For instance, on p. 15 it is stated that a "brown ppt. of SnS" is soluble in "SAm_2, re-pptd. by HCl"; and a little lower down that "Arsenic, arsenious compounds . . . Heated in tube all salts sublime." Both of these statements have so slender a foundation in fact that their direct tendency is to deceive the student. These are mere examples that might be multiplied considerably. Towards the end of the book, tables are given for the "Examination of Mixtures," and wherein they differ from the methods in common use they do not appear to be improvements upon them.

LETTERS TO THE EDITOR.

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of* NATURE. *No notice is taken of anonymous communications.*]

Engineers *versus* "Professors and College Men."

SOME of your readers may recollect that last year (NATURE, vol. xxxv. p. 462) I was led to put the following question to the *Engineer*:—"What is the result of dividing 10 eggs per minute by 2 eggs? Would it, or would it not, be 5 eggs per minute"? To this I have not yet received an answer! It must be very difficult!

I ventured to put the question because the *Engineer* had (in a leading article!) asserted that the result of dividing 3,942,400 foot-pounds per minute, by 33,000 foot-pounds, is 119·4 horse-power. It had actually accused me of ignorance for pointing out the error of such a statement!

But even this remarkable dictum is outstripped in absurdity by some of the *Engineer's* more recent assertions. I quote only a few, any one of which would be sufficient for my present purpose, leaving the vast storehouse to be fully ransacked by other inquirers more curious, and less busy, than myself.

On the 10th of August last the readers of the *Engineer* were treated to the following *ex cathedrâ* pronouncement:—

". . . it is almost impossible to point to anything of value in trade, or manufactures, or engineering which has emanated from the highly-trained Professor or College man."

No comment whatever need be made on this.

A fortnight later, in reviewing a book on the steam-engine, the *Engineer* remarks of Carnot's principle:—

". . . it will soon be understood that with steam this is not true. . . ."

There is nothing in the context to qualify this assertion, rather there is much to intensify and aggravate it. There is manifestly a confusion between temperature and pressure; but it is difficult to find its exact nature; and the only at all analogous case that I can remember is embodied in the indignant outburst of a Celtic student, hard pressed in an "oral," "D'ye mane to till me, Sor, that wather boils at a hundthred degrees in Oireland?"

It might well be thought that we had now gauged the maximum of possible absurdity. But, on September 28, the *Engineer* undertook to enlighten its readers on the subject of Energy; and the effort resulted in some astounding information.

Speaking of "the equation $E = \frac{Mv^2}{2g}$" (a form which will, perhaps, please my friend Prof. Greenhill, though to me it seems to denote merely the product of a mass by a length) our instructor says:—

"The received idea is that, so long as we get E equal to a given number of foot-pounds, it is of no consequence whether we vary v or vary M, . . . but if we introduce the element Time, *which ought not to be left out* [the italics are mine]. . . . The word Energy is unfortunately very vague. . . ." I shall presently recur to this.

October 5 is not without its little novelty. For, as we are gravely informed,

"That much despised faculty, common-sense, has always told engineers that when a given volume of air is passed through a channel or trunk, its pressure will fall as the trunk augments in dimensions."

Even the despised scientific man knows better than that!:—but, true to his convictions, the *Engineer* ignores the conclusions of such mere "Professors and College men" as Bernoulli, Willis, and Sir W. Thomson.

A week later, commenting on some sensible protests (which it prints, in order to refute (?) them) against its marvellous ideas about Energy, the *Engineer* gets back to something like last year's confusion, and mixes up work and horse-power in a manner truly amazing. This peculiar phase of his own mind is what the *Engineer* designates as the "vagueness" of the word Energy!

But the crowning feat is to come. In a very sensible and able introductory lecture to his engineering class at Leeds, Prof. Barr took occasion to speak of the advantages of preliminary scientific training for engineering students, and protested against the mischievous doctrines too often expressed by so-called "practical men" and their literary champions. He took the opportunity of giving a much-needed warning against the inaccuracies of the *Engineer*; referring (among others) to that already quoted about the failure of the Second Law of Thermodynamics.

He has had his reward! His difference of opinion from the *Engineer* is, of course, to be ascribed to youth, inexperience, want of breadth of knowledge, &c. The *Engineer* goes so far as to suggest such ugly ideas as "disregard for truth"; and, having done so, immediately proceeds to quote me by name as the author of a statement which, with the utmost possible distinctness, I had ascribed to its true author, the late Clerk-Maxwell.

Prof. Barr is quite able to hold his own against such ant-

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